

WHAT IS CLAIMED IS:

1. A wavelength characteristic variable filter comprising:  
a filter that is arranged in a path of a collimated beam and  
having a diffraction unit that is movable in a direction perpendicular to a  
5 direction of the collimated beam, wherein a wavelength characteristic of  
the filter is such that a transmittance changes with wavelength; and  
a moving unit that moves the diffraction unit.
2. The wavelength characteristic variable filter according to claim 1,  
10 wherein the diffraction unit is a slit having a pair of edges, wherein the  
slit is formed by removing a part of a film from a surface of the filter.
3. The wavelength characteristic variable filter according to claim 2,  
wherein  
15 a plurality of the filters are arranged in the path of the collimated  
beam, and  
the moving unit moves all or some of the slits simultaneously.
4. The wavelength characteristic variable filter according to claim 3,  
20 wherein the slits of adjoining filters make a predetermined angle with  
each other.
5. The wavelength characteristic variable filter according to claim 3,  
wherein the moving unit moves all the slits in one direction or moves  
25 each slit in a respective direction.

6. The wavelength characteristic variable filter according to claim 1,  
wherein the filter has a plurality of the diffraction units, the diffraction  
units are edges, and the edges are formed at a pitch of  $1/4$  or less of a  
5 beam diameter of the collimated beam.

7. The wavelength characteristic variable filter according to claim 1,  
wherein the moving unit moves the diffraction unit by using any one of  
an electromagnetic force driving mechanism, a thermal expansion  
10 driving mechanism, a piezoelectric effect driving mechanism, and an  
electrostatic force driving mechanism, or a combination thereof.

8. The wavelength characteristic variable filter according to claim 3,  
wherein the filters have different wavelength characteristics.

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9. The wavelength characteristic variable filter according to claim 1,  
wherein a reflection type filter is used as the filter, and  
a direction from which light enters in the reflection type filter and  
a direction towards which light is emitted out from the reflection type  
20 filter are same.

10. The wavelength characteristic variable filter according to claim 2,  
wherein the filter is an etalon filter in which the edges are formed on  
one portion of a reflection film.

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11. An optical amplifier comprising:

a filter that is arranged in a path of a collimated beam and having an edge that is movable in a direction perpendicular to a direction of the collimated beam, wherein a wavelength characteristic of the filter is such that a transmittance with respect to a wavelength is set;  
5 and

a moving unit that moves the edge of the filter to a predetermined position between a center and an edge of the collimated beam.

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12. An optical communications apparatus comprising:

a filter that is arranged in a path of a collimated beam and having an edge that is movable in a direction perpendicular to a direction of the collimated beam, wherein a wavelength characteristic of the filter is such that a transmittance with respect to a wavelength is set;  
15 and

a moving unit that moves the edge of the filter to a predetermined position between a center and an edge of the collimated beam.

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